Brief Overview of ESG-CET Architecture and Timelines

ESG-CET Federation Meeting
Princeton
October 2007

Main Goals for Next Generation ESG System

- Federation among ESG-CET funded institutions and external partners
- Direct client access to data, services
- Expanded functionality :
  - Semantically based data search
  - Visualization
  - Server-side processing

+ support current operational systems (LLNL, ORNL, NCAR)
+ more robustness, testability, deployability, performance

Three Tiers Architecture

ESG Global Portal & Services
(single-sign-on authentication, authorization, federated metadata catalog (RDF), notification, monitoring)

ESG Gateway (NCAR)

ESG Gateway (PCMDI)
(user registration & management, full system metadata, search & browsing, "pull" data publishing, data product broker)

ESG Gateway (ORNL)

ESG Data Node

ESG Data Node

ESG Data Node
(data, data servers, "push" data publishing)

ESG Data Node

ESG Data Node

Deployed Components Stack

RDBMS
Global, Replicated
User Attributes
& Resource Policies

Single Sign On server
(CAS ?)

RDF Triple Store
(Sesame)

Metadata RDBMS
(Postgres)

ESG-CET Gateway
(Tomcat Web App)

LAS
Product Server

Visualization Engine
(Ferret, CDAT, NCL)

TDS

HTTP
Server

FTP
Server

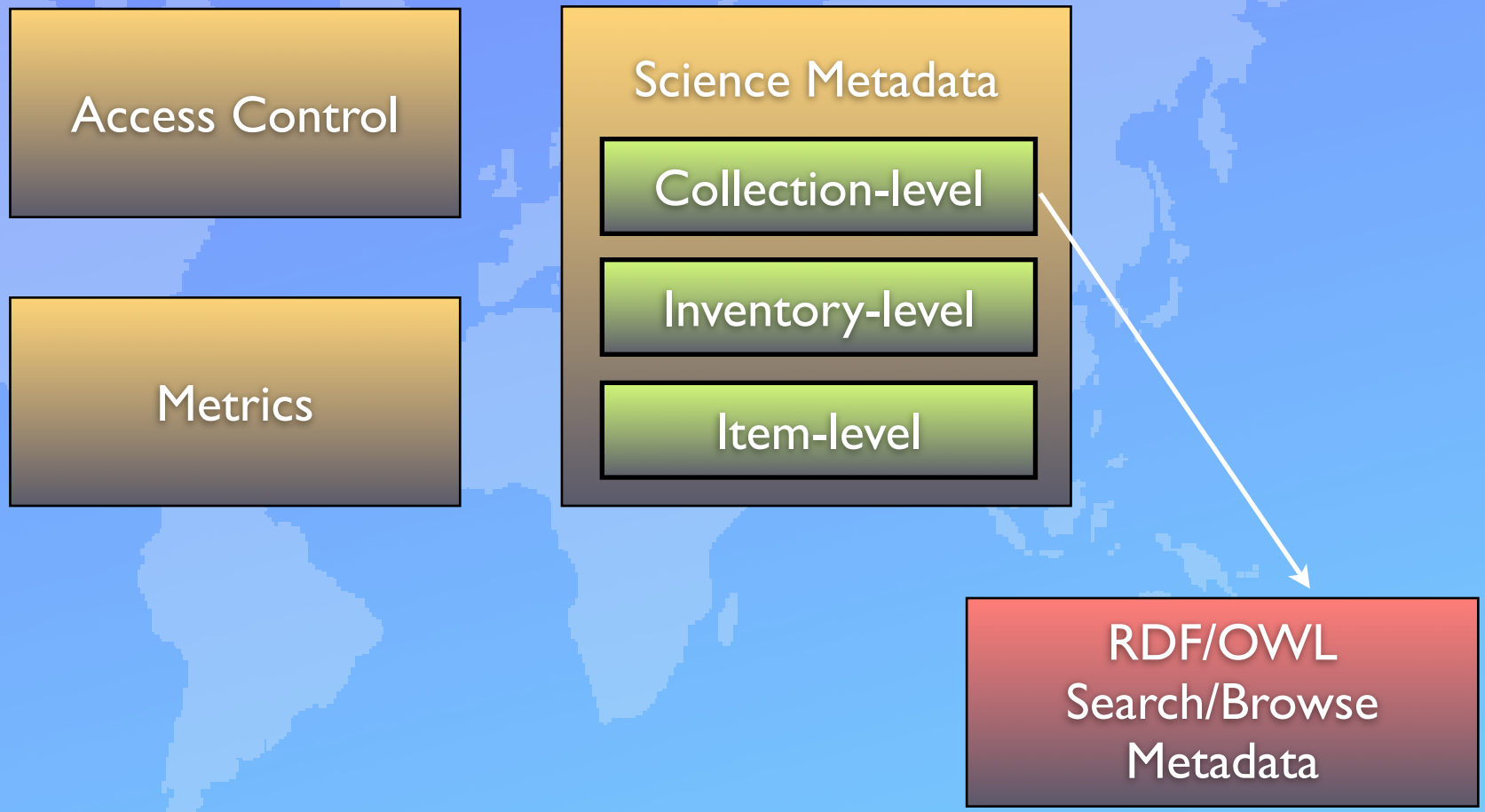
OPeNDAP-G
Back End Server

Disk Data

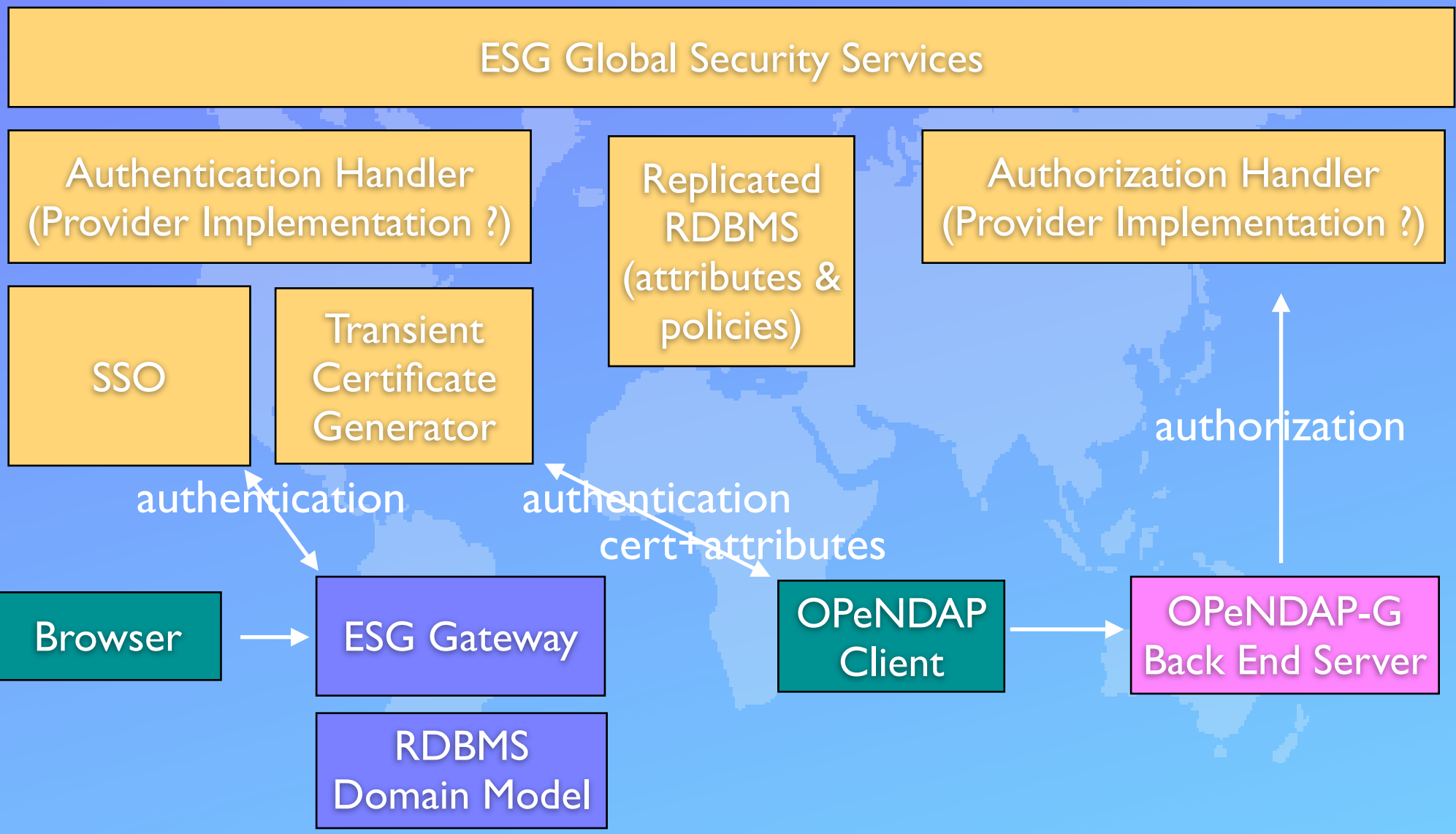
Tape Data

SRM

ESG-CET Domain ("Data+Metadata) Model



ESG-CET Security Architecture



Central Authentication Server (CAS)

- Single Sign On solution for a (single) Virtual Organization
  - SSO server (Spring web app running within Tomcat)
  - LIbrary of clients for Java, perl, python, .Net, Apache,...
- Successfully prototyped use of CAS to provide SSO for multiple ESG-CET Gateways

CAS Advantages

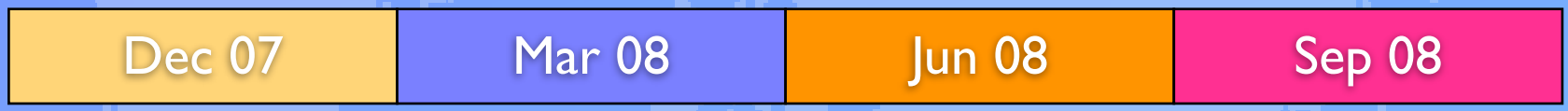
- Integrates with Acegi (both on server and client side)
- CAS server may poll multiple authentication providers
- Allows branding of CAS server via Spring themes
- Supported by TDS
- New in CAS 3.1: load balancing, open-id, Google Accounts, SAML 2.0
- "Recipes" for integration of CAS+Shibboleth
  - CAS as Shibboleth identity provider
  - Shibboleth as CAS authentication provider

Technologies

- Gateway Web Application software:
  - Tomcat, Java, Spring, Acegi, Hibernate, JSTL
- Metadata:
  - RDBMS (Postgres) + OWL Ontology w/Sesame
  - Thredds compliant (in/out)
  - RLS ?
- Security: GSI, MyProxy, CAS ?
- Data Product Servers: LAS, TDS, OPeNDAP-G, FTP ?, HTTP ?

Timeline

Deadline: new system operational by October '08 (IPCC AR5)
Plan: quarterly software releases



1. Dec '07: Standalone Gateway with basic functionality
2. March '08: Standalone Gateway with expended functionality
3. June '08: Integration with Data Node servers
4. September '08: Federation among Gateways